MEDIA FORMULATION TO SUPPORT THE GROWTH OF VERO CELLS IN SUSPENSION

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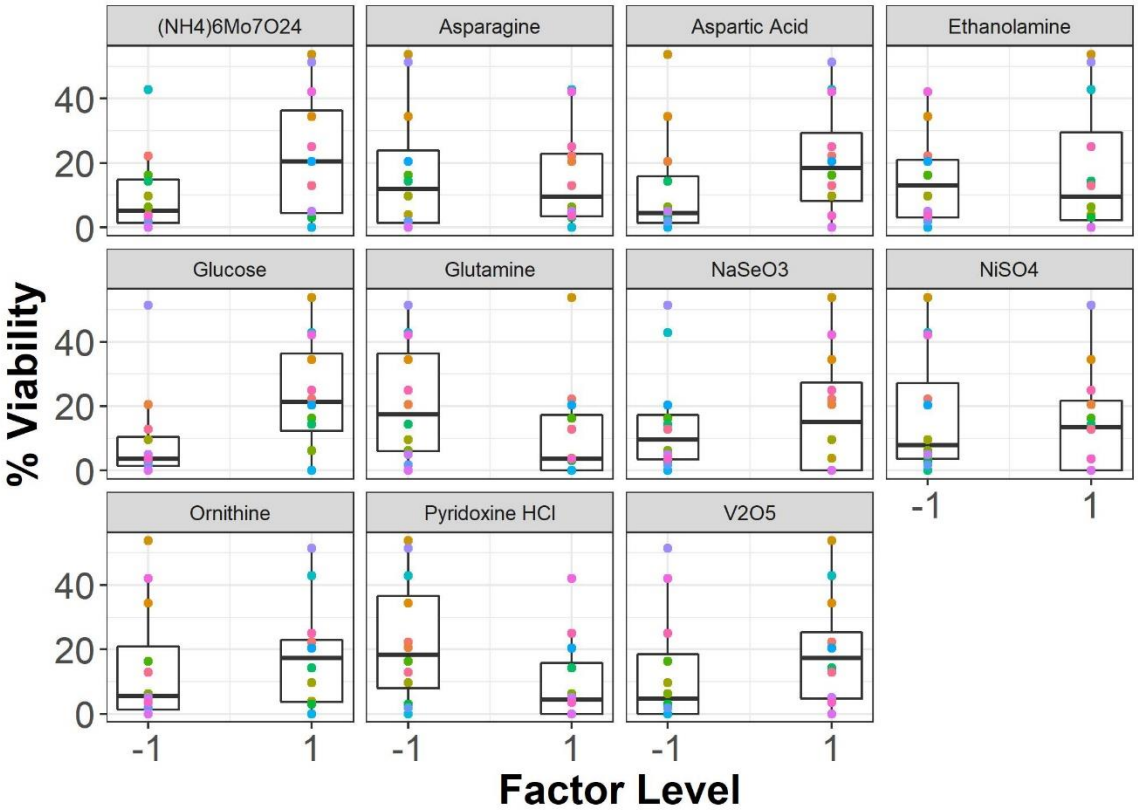
Vero cells are used in the production of many commercial vaccines but is limited due to their anchorage dependence. In order to scale up production, manufacturers have to use microcarriers for production using bioreactors or large rooms of roller bottles or cell stacks. These support matrices are essential for Vero cell growth and proliferation, but add substantial cost for vaccine production and limit the scalability. Using a design of experiments approach, media was that support the growth of Vero CCL-81 cells in suspension. First, a Plackett-Burman experiment was set up with 24 runs testing 23 factors using low calcium and magnesium DMEM/F12 as the base media. The factors were chosen to support suspension growth in serum-free media and could be split into four categories; amino acids, antioxidants, trace metals and vitamins, and growth factors. Cells were first adapted to serum free conditions using OptiPro SFM media in and then were gradually adjusted to the new various media formulations. L-glutamate and L-glutamine had a negative effect on cell viability when GlutaMax was already present in the media, while L-asparagine and L-aspartic acid were beneficial for suspension and suspension cell growth. Cells growing in suspension also benefited from increased levels of L-leucine, L-lysine, and L-methionine. The addition of rEGF and trace metals were essential for cell growth and high levels of selenium and ethanolamine ($3x10^{-4}$ mM and 0.041 mM, respectively) supported serum free growth. Further characterization of nutrient consumption patterns using 1D-1H NMR coupled with targeted profiling has aided in the refinement of media for enhancing the suspension phenotype.



STABILIZATION OF FREEZE SENSITIVE ADJUVANTED VACCINE FORMULATIONS TRHOUGH SPRAY DRYING

Figure 1 – Viability of suspension cells was after 4 days of culture was tracked. The percent viability is plotted against the factor levels of 11 compounds that had large effects on cell health.